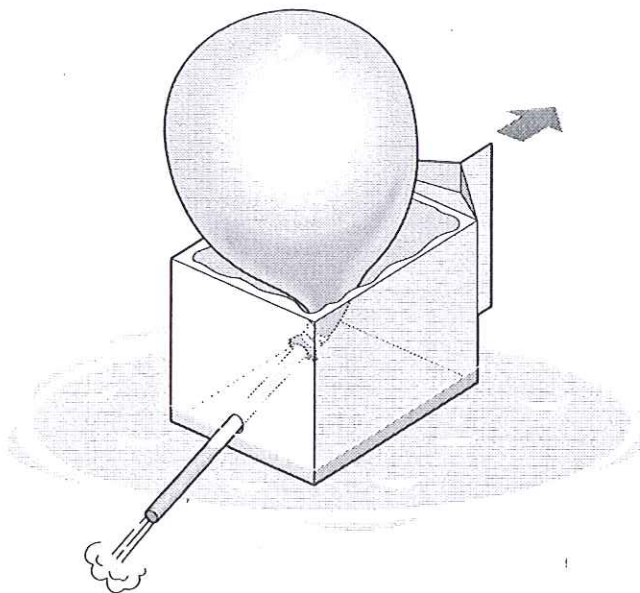


# How to Build a Balloon Boat

7. Working from the inside of the boat, put the end of the ballpoint pen tube that isn't attached to the balloon through the hole in the back of the boat. The balloon should be inside the boat.



## Operating your boat:

1. Use a water pitcher to fill the basin halfway with water. (Then return the pitcher to the supply area for other groups to use.)
2. Move the pen tube and balloon so that the balloon sticks up out of the milk carton at an angle. Have the selected group member blow on the other end of the tube to inflate the balloon all the way.
3. Without letting the air from the balloon escape (keep the free end of the pen tube covered with your finger), quickly place the balloon boat at one end of the basin, with the pen tube pointing backwards. Then release it. Make sure the free end of the pen tube is beneath the surface of the water.
4. **Important:** After each trial, rinse the end of the pen tube that you blew on. Use the cup of warm soapy water, followed by the warm rinse water.

**Challenge:** Modify your boat to improve its performance. Try using different balloon sizes and shapes, changing the angle of the tube, and other ideas.

# How to Build a Balloon Boat

**Goal:** Build a boat that uses energy transfers to “go.”

## Materials:

- Basin to hold water
- Empty milk carton, pint-size
- Ballpoint pen tube, ink cartridge removed
- Several balloons, assorted sizes
- Scissors
- Rubber band, small
- Tape
- Paper cup with several drops of dish soap, filled with warm water
- Paper cup filled with clean warm water
- Paper towels, several sheets (to clean up any water spills)

## Directions:

*Follow these steps to build your boat. You can make changes to these directions if you need to in order to make your boat go.*

1. Make a watertight seal by taping the top of the milk carton shut so it looks unopened. (Then return the tape to the supply area for other groups to use.)
2. Lay the milk carton on its side. The taped edge of its top should go up and down vertically.
3. Cut out the side of the milk carton that faces up so that you have a large rectangular opening.
4. Make a small hole in the middle of the back of the boat. Make the hole slightly smaller than the diameter of the ballpoint pen tube.
5. Insert the ballpoint pen tube into the neck of the balloon about 2½ cm (1 in). Put a rubber band around it to keep it in place.
6. Choose **one** group member to blow up the balloon. To avoid spreading germs, this individual is the **only** one allowed to blow up the balloon. (*Group members with extra ballpoint pen tubes can create their own balloon setups but should be careful to use only their own balloon and tube.*) Test it by blowing into the open end of the ballpoint pen tube to see if the balloon inflates. If necessary, adjust the ballpoint pen tube and the balloon so the connection is tight and secure.